

# W5YI

America's Oldest Ham Radio Newsletter

## REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable.

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## FCC Creates Low Power FM Broadcast Radio Service!

*LPFM originally requested by two Extra Class Ham Radio Operators*

"Every day, it seems, we read about a bigger merger and more consolidation, all of which leads to the perception that the interests of small groups and individuals are being lost, and that important voices and viewpoints are being shut out. ...there is more room at the table; there is spectrum available for these and other uses. But rather than being able to use the available spectrum to test their ideas in the marketplace, these groups are being shut out, prohibited from serving their communities. ...Today we recognize the important role of more modest technical facilities, and throw open the doors of opportunity to the smaller, community-oriented broadcaster." ...**FCC Chairman William Kennard**

"We've heard from thousands of individuals, schools, churches, community groups and local government agencies who would like to use the public airwaves to serve their communities, but cannot under our existing rules. ...Providing an outlet for new voices to serve their communities is why I am proud to support this new service. ...**FCC Commissioner Gloria Tristani**

"Today we establish a new, unmistakably local radio service on the FM band, carefully crafted to ensure that community-based voices are heard, while maintaining the technical integrity of the full powered service. In so doing, we have enabled students, community organizations, churches, and those underrepresented in conventional broadcasting to provide programming of special interest to community and niche populations." ...**FCC Commissioner Susan Ness**

**G**et ready for a new group of alternative music, religious, local government and educational programming that could be on the FM broadcast dial as early as this summer ...and headquartered right in your neighborhood.

The FCC voted 4-1 on January 20<sup>th</sup> to create a new class of low-tech FM broadcast stations designed to "...serve very localized communities or under-represented groups within communities" by authorizing two new classes of noncommercial low power FM (LPFM) radio services (*Mass Media Docket No. MM- 99-25*.)

The driving force behind the proceeding are complaints from small communities, churches and other local organizations who say they are prevented from airing their views by the massive consolida-

tion of commercial radio stations. Former limits on station ownership were lifted by Congress in 1996, leaving companies free to amass hundreds or thousands of radio stations. As of the end of last year, the top 10 broadcasters controlled 2,000 stations ...more than triple that of just three years earlier.

### The original LPFM proposal

In an effort to help regular FM stations grow and become financially viable, the FCC stopped licensing low-powered FM radio stations around 1978.

In a *Notice of Proposed Rulemaking* (NPRM) adopted on January 28, 1999, the FCC proposed to license new 1000 watt (LP1000) and 100 (LP100) watt low power LPFM radio stations. In addition, the



FCC asked for comment on whether to license "micro-radio" stations between 1 and 10 watts.

The NPRM was issued after two Extra Class ham operators: Nickolaus Leggett N3NL of Reston, Virginia and Rodger Skinner W4FM of Pompano Beach, Florida filed *Petitions for Rulemaking* with the Commission during early 1998.

Leggett wanted the FCC to adopt a "Microstation Radio Service" which would permit low power broadcast stations on both the AM and FM broadcast band which he said would help "...energize" small geographic, political or cultural communities

Skinner asked for three new types of Low Power FM broadcast stations: a special event class (LPFM-3), small community 50W class (LPFM-2) and a higher powered - up to 3KW - (LPFM-1) "structured type" of station with local owners.

In the NPRM, the FCC proposed one thousand watt stations which would have reached an audience up to ten miles away, 100 watt stations would have a range of 3.5 miles and 1 to 10 watt stations - if adopted - would serve areas 1 to 2 miles from the transmitter. Antenna height was proposed to be 60 meters (about 200 feet) for LP1000 stations and up to 30 meters (100 feet) for the other two classes. The Commission also proposed minimum distance separations as the best practical means of preventing interference between low power radio and full power FM stations. The FCC left open the question as to whether LPFM stations could be profit-making.

LPFM is largely a campaign of William Kennard, the FCC's first African-American Chairman and a frequent critic of consolidation in the broadcast industry.

"We all know that as more and more stations become concentrated in fewer and fewer hands, there are fewer opportunities for people who want to use the airwaves to speak to their communities," Kennard said.

"These proposals would create a whole new FM service, a whole new class of voices using the airwaves to speak to their communities. Opportunities for churches, and community groups, and non-profit organizations, small business, and minority groups, so many of whom feel that they are being frozen out of opportunities to become broadcasters."

## FCC scales down low power broadcasting

When the dust cleared from what was a very contentious public comment period, however, the FCC settled only two new classes of non-commercial low-power stations with power levels of 1 to 10 watts (LP10) and 50 to 100 watts (LP100). The threat of interference persuaded the FCC to back away from the possibility of 1,000 watt stations.

The Commission also adopted interference protection requirements based on distance separation between stations to guard against interference to existing FM stations and to not inhibit the ability of existing radio stations to transition to *In Band-On Channel* (IBOC) digital transmissions in the future.

The FCC will impose station separation requirements between new LPFM and existing radio stations on co-, 1st-, and 2nd- adjacent and intermediate frequency (IF) channels, but will not impose 3rd adjacent separation requirements because the engineering data and tests in the proceeding demonstrated that 100 watt LPFM service will not cause any unacceptable levels of interference to existing radio stations separated by three channels.

Those eligible to obtain LPFM licensees include noncommercial government or private educational organizations, associations or groups; non-profit entities with educational purposes; or government or non-profit organizations providing local public safety or transportation services. LPFM licenses will be awarded throughout the FM radio band and will not be limited to the channels reserved for use by noncommercial educational radio stations.

To further its goals of diversity and creating opportunities for new voices, no existing broadcaster or other media entity can have an ownership interest, or enter into any program or operating agreement, with any LPFM Station. LPFM stations are being encouraged to originate local programming and will be prohibited from operating as translators.

During the first two years, LPFM licensees may only operate one station and must be located within 10 miles of the station. LPFM stations will be licensed for eight-year, renewable terms and these licenses will not be transferable. Four-letter call signs will be assigned with the letters LP appended.

Applications will be accepted in designated five day filing windows. The first filing window to be opened will be for LP100 licenses. The FCC believes a filing window system is preferable to a first-come/first-serve filing system which might disadvantage some potential applicants.

The *Communications Act* exempts noncommercial services from the auction requirement; that is, being sold a license. The FCC will decide cases where there are multiple applicants for one license using a selection process that awards applicants one point each for

- (1) certifying an established community presence of at least two years prior to the application,
- (2) pledging to operate at least 12 hours daily, and
- (3) pledging to air at least eight hours of locally originated programming daily.

Applicants with the same number of points may be able to share on-the-air time or may be awarded successive one



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year non-renewable license terms.

Eligible licensees will be subject to the same character qualifications as are currently applied to full power licensees. "Pirate" FM radio stations that have broadcasted without a license in the past may apply for LPFM licenses if they certify:

- (1) that they had voluntarily ceased engaging in unlicensed operations no later than February 26, 1999, without specific direction from the FCC, or
- (2) that they had ceased engaging in unlicensed operations within 24 hours of being advised by the Commission to do so.

"Pirate" stations who continued illegal broadcasting will be ineligible for any broadcast license.

LPFM stations will be required to broadcast a minimum of 36 hours per week, will be subject to various statutory rules, such as sponsorship identification, political programming, prohibitions of airing obscene or indecent programming, and requirements to provide periodic call sign announcements, and must participate in the national *Emergency Alert System* (EAS).

## Up to 1000 new LPFM stations

The FCC believes that up to a thousand new low power stations can be sandwiched into the current FM band without causing interference. Licenses will be non-transferable and local ownership is required for the first two years. Where there are numerous applications for LPFM licenses in similar areas, priority will be given to those with an established community presence who pledge to provide more local programming over a longer broadcast day.

But as FCC Commissioner Harold Furchtgott-Roth pointed out, "...there will be precious few new licensees in urban markets." Major cities like New York, Los Angeles, Chicago, Philadelphia, San Diego, Dallas, San Francisco, Washington, Charlotte, and Miami will only get new 10 watt stations since there is no spectrum there for 100-watt stations. But there is room for dozens of 100 watt stations in most less dense areas.

LP-10 stations have a range of about 1 or 2 miles from the antenna while LP-100 could reach a community up to 3.5 miles away. The low-power stations also cost many times less than the average FM broadcast station operating at 6,000 to 100,000 watts. For one thing, they can mount their antennas on top of a building rather than constructing an expensive, free-standing tower.

## The pros and cons of LPFM

Calling it a "...sad day for radio listeners," Eddie Fritts, president of the *National Association of Broadcasters* charged the FCC with choosing "social engineering"

over responsible spectrum management. "Thousands of people won't be able to hear their hometown radio stations because of this."

You can expect a stinging *Petition for Reconsideration* from the NAB. Several lawmakers sided with Fritts, including Rep. Billy Tauzin, R-La., chairman of the *House Commerce Subcommittee on Telecommunications*.

To say that existing FM stations are not pleased with the LPFM result is an understatement. They *publicly* say the new LPFMs will interfere with existing nearby stations. And at least one FCC Commissioner agrees.

FCC Commissioner Harold Furchtgott-Roth labeled the LPFM concept as "...entirely irresponsible." He said "...this entire proceeding has been marked by a rush to judgment. The Commission has simply not taken the time to do the right technical studies, the right way."

But low power advocates say the real reason for dissatisfaction among the broadcast industry is they don't want competition for the local listener where audience ratings determine their future.

FCC Chairman William Kennard does not agree with the interference theory. He said LPFM has had thorough testing and analysis and that low-power FM stations will have a minimal impact on commercial broadcasters.

Another FCC commissioner, Michael Powell dissented in part. He said he did not quibble with the Commission's objectives. "I must confess that I have no clear idea as to whether or not existing broadcasters will suffer intolerable interference," he said.

Borrowing a term from the medical profession, Powell said "...when trying to treat a problem, we should 'first do no harm.'" He questioned whether existing small or independent FM stations would be adversely impacted because "...the presence of one or more LPFM stations will certainly dilute audience share, on which securing advertising dollars is based." While the FCC "...has endeavored to minimize the dangers of interference.... It wrongly has ignored ...small market broadcasters," he said.

"The proponents of LPFM retort that the number of new stations will be few in a given market, and limited in their reach. Perhaps, in some markets this is true. But, the 41 new station possibilities in Elko, Nevada and Springerville, Arizona, or the 25 new station possibilities in Billings, Montana certainly are not trivial to the established stations in those small, rural markets."

The FCC is likely to begin accepting applications in the Spring and will issue a *Public Notice* 30 days before accepting any applications. Application forms and information on how to file applications for low power radio stations will be posted on to the FCC's website at: <<http://www.fcc.gov/mmb/prd/lpfm>>. Info on broadcast radio equipment is available at: <<http://www.broadcast.net>>.



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• **The ARRL says it intends to seek Partial Reconsideration of Restructuring R&O** on two points in the Amateur Radio license restructuring plan announced by the FCC, December 30. The League will ask the FCC to continue to maintain records that indicate whether a Technician licensee has passed a Morse code exam to earn Novice/Tech Plus HF privileges. Under the current system, the license class of Technicians is designated by a "T" in the FCC's amateur database, and of Tech Plus licensees by a "P." Under the FCC's restructuring plan, Technician and Tech-Plus licensees will all be known simply as "Technician."

The ARRL also plans to ask the FCC to stipulate that any amateur who provides proof of having passed an FCC-recognized Morse code exam prior to April 15 would be entitled to receive credit for the Morse code exam element when applying for future upgrades.

The ARRL Board of Directors approved a motion to file the *Petition for Partial Reconsideration* at its January 22 meeting in Memphis.

• **Kenwood has asked the FCC to rule on its "Sky Command" system.** Kenwood Communications Corporation wants the FCC to either to declare that its "Sky Command" system complies with Commission rules or to waive applicable sections of the rules to make it legal.

The "Sky Command" system, which Kenwood has been marketing for about two years, lets the user control a fixed HF station via a pair of dual-band transceivers. "Sky Command" operates in full duplex, using a 70-cm frequency to transmit audio and control commands to a dualband transceiver at the remote station and a 2-meter frequency to transmit received audio via the remote station's SkyCommand transceiver to the operator's transceiver.

Sky Command's VHF link also includes a Morse code ID. The ARRL has declined to permit Kenwood to advertise its "Sky Command" system in QST, maintaining that the system is not legal to use as it's configured. The League says that Kenwood's use of a 2-meter frequency would cause amateurs using the system to violate Section 97.201(b), which limits auxiliary operation to certain frequencies above 222.15 MHz.

In its *Petition for a Declaratory Ruling or Waiver* - filed November 4 but not released until December 15 - Kenwood claims that the "Sky Command" VHF transmission link "...should be viewed as merely providing third party communications" and not as part of an auxiliary link."

Kenwood says it "...is confident that the 'Sky Command System' fully complies with the remote control, telecommand, and auxiliary station provisions of Sections 97.109(c), 97.213, and 97.201."

Kenwood wants the FCC to confirm in a declaratory ruling that the "Sky Command System" complies with those rules. But, Kenwood said, if the FCC does not concur, then Kenwood requests a "blanket waiver" of those rules for amateurs using "Sky Command."

Kenwood also asks for either a declaratory ruling or a blanket waiver with respect to Section 97.111, which covers authorized transmissions. The manufacturer says the VHF link complies with the rules because it only carries audio from the HF station receiver, is not involved with telecommand of the remote station, and is under the supervision of the control operator.

Comments on the Kenwood petition were due by January 31, 2000; reply comments by February 14, 2000. Commenters should reference DA 99-2805.

• **The ARRL has elected a new president and slate of officers.** Jim D. Haynie, W5JBP, of Dallas, Texas, was elected by the ARRL Board on January 21 at their recent Memphis Board meeting. Haynie, 56, the currently the West Gulf Division Director, succeeds Rod Stafford, W6ROD. Haynie said his presidency will focus on the future of Amateur Radio. "I think it's time the League started changing," he said.

A ham for 27 years and an ARRL Board member for 12 years, Haynie has held every leadership position within Amateur Radio. He is a previous president of the Dallas Amateur Radio Club, Section Manager, Vice Director, Director and ARRL Vice President. He also currently chairs the ARRL Board Administration and Finance Committee.

The Board also elected new vice presidents. Vice President Joel Harrison, W5ZN, was elevated to First Vice President. Current Atlantic Division Director Kay Craigie, WT3P, and Roanoke Division Director John Kanode, N4MM, were picked as Vice Presidents. Current Vice President Hugh Turnbull, W3ABC, was elected Honorary Vice President.

• **Amateur Radio will be available to the first crew members to live on the International Space Station,** thanks to some quick shuffling of plans by those involved with the Amateur Radio on the International Space Station project. Initial ham gear now will be installed temporarily aboard the Functional Cargo Block module, already in space, instead of aboard the Service Module. The station would use existing non-ham antennas that can function on 2 meters.

An all-ham initial ISS crew and the amateur gear could go into space as early as this summer, instead of this spring as planned. The Russian space agency plans to put the Service Module into space at the end of July. The ham equipment eventually will be installed in the Service Module. [Thanks ARRL]



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## AMATEUR RADIO STATION CALL SIGNS

...sequentially issued as of the first of February 2000:

Radio District	Group A Extra	Group B Advanced	Group C Tech/Gen.	Group D Novice
0 (*)	AB0JU	KI0RL	(***)	KC0HDX
1 (*)	AA1UV	KE1LW	(***)	KB1EUA
2 (*)	AB2GW	KG2RG	(***)	KC2FWX
3 (*)	AA3TG	KF3DS	(***)	KB3EOO
4 (*)	AF4QU	KV4DW	(***)	KG4GDD
5 (*)	AC5TQ	KM5WR	(***)	KD5JCI
6 (*)	AD6JT	KR6DV	(***)	KG6ABH
7 (*)	AC7BV	KK7VO	(***)	KD7HTR
8 (*)	AB8ES	KI8JM	(***)	KC8NSB
9 (*)	AA9XM	KG9QN	(***)	KB9VRM
N. Mariana	NH0P	AH0BB	KH0IK	WH0ABJ
Guam	(**)	AH2DN	KH2UU	WH2ANX
Hawaii	WH7T	AH6PZ	KH7YZ	WH6DGT
Am.Samoa	AH8R	AH8AI	KH8DO	WH8ABF
Alaska	AL0S	AL7RP	KL0VN	WL7CVD
Virgin Isl.	(**)	KP2CP	NP2KR	WP2AIN
Puerto Rico	WP3F	KP3BL	WP3FS	WP4NOT

\* = All 1-by-2 & 2-by-1 call signs have been assigned.

\*\* = All 2-by-1 call signs have been assigned.

\*\*\* = Group "C" (N-by-3) call signs have now run out in all districts. Group "D" calls now being assigned.

**Note:** New prefix numerals now being assigned in Puerto Rico (KP3/NP3/WP3), Hawaii (AH7/KH7/WH7) and Alaska (AL0/KL0)

[Source: FCC Amateur Service Database, Washington, DC]

## NEW AND UPGRADING AMATEUR STATISTICS

For the Month of January 1998, 1999 & 2000

License Class	New Amateurs			Upgrading Amateurs		
	1998	1999	2000	1998	1999	2000
Novice	41	41	21	0	0	0
Technician	912	724	545	0	1	0
Tech Plus	78	79	53	249	159	458
General	16	17	10	260	154	150
Advanced	4	4	0	198	127	195
Extra Class	2	6	0	147	77	167
<b>Total:</b>	<b>1053</b>	<b>871</b>	<b>629</b>	<b>854</b>	<b>518</b>	<b>970</b>
Decrease:	(32%)	(17%)	(28%)	(16%)	(39%)	+87%

## AMATEUR RADIO ENFORCEMENT NEWS

• The FCC is conducting a third audit of a South Carolina examination session managed by **William J. Browning, AF4PJ (Extra Class) of Pendleton, S.C.** The exam session was held in Iva, South Carolina on October 9, 1999. **James F. Chambers KF4PWF (Extra Class) of Greenville, S.C.** and **Eugene D. Watring AF4DB (Extra Class) of Iva, SC** were listed as assisting Volunteer Examiners. Riley Hollingsworth has forwarded them copies of the examination session paperwork and wants to know if the signatures on the documents are theirs, if

they were present at the exam session and what was his involvement in the examinations.

• The Commission is also conducting an audit of examination session that took place in Huntington Beach, CA on September 12, 1999 in which **Daniel Granda KA6VHC of Whittier, CA**, **Juan Huitron, AC6HK of Santa Ana, CA** and **Moises Morales, KB6QMR of Garden Grove, CA** (all Extra Class VEs) are listed as Volunteer Examiners. Several irregularities regarding the examinations were noted and their names, signatures and call signs were applied to each of the documents. The discrepancies involved missing telegraphy exam documents and questionable scoring. The FCC wants to know if the signature on the documents are theirs and if they were present at the examination session. Riley Hollingsworth also wants to know why nearly all of the applicants all missed the same question in the code test.

• On December 1, 1999, the United States District Court in Maine, dismissed, with prejudice, **Glenn A. Baxter's K1MAN (Extra Class) of Belgrade Lakes, ME** lawsuit against the FCC. The Court also dismissed Baxter's petition for reconsideration of the dismissal. Baxter has now filed a notice of appeal with the U. S. Court of Appeals.

• The FCC has received a complaint alleging slander and threats that took place on the N4MOT Motorola Amateur Radio Club repeater system on December 15, 1999. **Robert A. DiMezza, W2GGI (Advanced Class) of Delray Beach, FL** has been given 20 days to respond to the complaint. This information will be used to determine what, if any, action the FCC will be taking against him. Additionally, DiMezza is expected to comply with the Jan. 10, 2000 request directing him to cease operation on the N4MOT repeater.

• **Juanita S. Roush KC8CQC of Wooster, OH** has been ordered to retake all of the license examinations up to and including the Extra Class ...including Elements 1(C), 2, 3(A), 3(B), 4(A) and 4(B) under the supervision of an examination coordinated by the American Radio Relay League. This examination must be completed on or before February 29, 2000.

• **Dale Buxton W6PWY of Claremont, CA** and **Larry Labb KI7AX of West Covina, CA** complained in a Nov. 1<sup>st</sup> letter to their Congressman that a "Meeting Notice" of the *Southem California Repeater and Remote Base Association* (SCRRBA) stated that voting would be limited to "full members"...those who had paid their dues and own or operate a SCRRBA coordinated relay system. Buxton and Labb contend that this policy is exclusionary and in violation of the Amateur frequency coordination rules. They asked the FCC to issue a "cease and desist order" against SCRRBA.

The FCC said the complainants were previously informed by the FCC in an Oct. 20, 1999 letter that "Changing coordinators is the mechanism that the Commission anticipates Amateur radio operators in a local or regional area would use to replace a frequency coordinator that was not representative of all local Amateur radio operators or otherwise meeting their needs."

Riley Hollingsworth ruled "In view of the above, SCRRBA's action does not warrant enforcement and we decline to take action in this matter."



## CUTTING EDGE TECHNOLOGY

■ **"No-talent rock star" may indeed be correct in some cases.** The ATR-1, made by Antares, is a piece of electronic audio gear that incorporates digital signal processing to change the pitch of a voice or an instrument in real time. The internal computer examines an incoming audio waveform and compares it against a user-specified list of particular frequencies it's supposed to adjust. If the pitch is originally correct, nothing changes. If the pitch is off, the frequency is automatically changed. It works on practically all voices and instruments.

■ **Maxim offers digital potentiometers.** With no moving parts, the MAX-5160 chip offers 32 levels of voltage shift, controlled through an incoming digital serial connection. The digital pot is only three millimeters on each side and comes in three linear resistance values.

■ **American Airlines has begun offering movies on DVD to first-class passengers on some international flights.** Each flier receives a personal DVD player and a choice of up to 20 movies. These particular DVDs are specially encoded so they won't work on home DVD machines, to help cut down on disc theft.

■ **Hams cautious of RF burns and exposure to microwave radiation may find the Visible Photographic Man to be of interest,** because it helps doctors learn how certain radiation doses affect internal organs of the human body. The Rensselaer Polytechnic Institute combined several techniques (including MRI and computer graphics from other sources) to simulate a 3-dimensional model. The Visible Photographic Man will help doctors find out more about how radiation affects eyes and other tissue.

■ **Clock circuits in critical applications often use temperature compensation to avoid frequency drift.** A thermistor usually works fine in this manner. But one of the newest oscillator control methods involves a direct connection to the computer bus itself; if the computer senses that an output frequency isn't what it should be, it writes a burst of data to a digital-to-analog converter (DAC). The DAC then sends a control voltage to the oscillator circuit for adjustment.

■ **With so many telecommunication formats, it's sometimes difficult to identify a particular outlet in an office.** Does it carry digital data? If so, how fast? And in what format? That's what Psiber's LanMaster 30 will tell you. Plug it into the connector and it will tell you if it's connected to a 10BaseT system, token ring, an ordinary telephone line, or an ISDN line. It can also tell you if the socket isn't connected to anything.

■ **Law enforcement officials have examined electricity bills for homes they think are used for growing plants that are made into illegal drugs.** Now they are using infrared cameras to look at the "heat signature" of suspected drug houses because the high-intensity lamps used for growing indoor plants generate vast amounts of heat, as well as consume vast amounts of power. If one house on the block lights up like a road flare under infrared, it can help the police seal a case.

■ **Toggle switches with light-emitting diodes (LEDs) built into the tips of the levers are now available from NKK Switches.** They come in a variety of colors and applications, from single-color to dual-color, dependent or independent of lever position.

■ **Goodbye, time clock.** Business computer networks now use clock-in/-clock-out software to keep track of company employee comings and goings. Workers type in and type out from their workstations. Want to find out who's in the office? Just point and click. Are there any messages for you since returning from lunch? The mailbox will tell you.

## EMERGING COMMUNICATIONS

■ **Researchers have pumped high-definition television (HDTV) signals through Internet2, the next generation of the Internet.** Late last year, HDTV signals were successfully exchanged between Stanford University in California and another school in Seattle. Capable of exchanging data at over 2 gigabits per second, Internet2 could become a method of program exchange between video providers and TV stations, or even TV stations and viewers. It's more than 50,000 times faster than your current Internet link.

■ **The United States isn't the only country running out of phone numbers.** Great Britain has had to overhaul

their national telephone numbering standards three times in ten years. The latest change comes in April with the addition of an extra digit in each phone number.

■ **You know what VCRs are, but do you know about PVRs?** Personal video recorders store TV programming on a hard drive similar to those on a PC. Forrester Research says 14 million people will be using PVRs within four years. ReplayTV (cost \$700) can store 20 hours of video while TiVo has a capacity of 14 hours (\$500 plus a monthly programming fee.) PVRs are programmed to provide your own customized television channel. The Yankee Group says 500,000 will be sold this year. Cable operators and broadcast networks believe the recorders should be subject to licensing agreements since they compose customized channels similar to a cable channel.

■ **Motorola Develops Methanol Batteries** - Researchers in its own labs and at the Los Alamos National Laboratory are working on a new mini battery for wireless devices. The fuel cell, which uses methanol as the power source, reportedly will last 10 times longer than batteries used today, but consumers will have to wait for at least three years to see them in the stores. The battery will be packaged in a see-through tube, thus enabling users to check their battery supply at any given time. The cost of the battery should be in line with current power supplies, Motorola says. [Reported by Reuters.]

■ **Sexy, sultry actress of the 30's and 40's, Hedy Lamarr died January 20<sup>th</sup> at age 86.** Few people know that she invented and shares a Aug. 11, 1942 U.S. patent for a "Secret Communications System" ...a technique that later would be called frequency hopping spread spectrum. The concept was developed to prevent jamming of radio-controlled torpedoes by the Germans during the Second World War.

Born Hedwig Kiesler in Austria, Hedy learned a lot about munitions from her first husband, Austrian armament manufacturer Fritz Mandl, whom she left before she came to Hollywood in 1937.

The patent is shared with a musician friend, George Antheil and was developed at a piano keyboard. Lamarr theorized that if a radio signal could follow a set pattern like key notes being sequentially played on a piano, the signal could not be blocked unless the jumping formula was known. If both the sender and the



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receiver were hopping in synch, the message would come through loud and clear, Lamarr speculated. The initial system used piano rolls to synchronize the torpedo and its controller.

The Navy said that clockwork mechanism controlling the hopping scheme by a paper tape was too massive and unwieldy. It took 20 years and the invention of the transistor for the technology to be feasible. Today, the technology is widely used as a method to multiplex or overlay signals on a band of spectrum.

Neither Lamarr nor Antheil ever received any royalty payments for the commercialization of their patent. Sylvania developed the concept for use in satellites when their patent expired.

■ **Semiconductor manufacturers and scientists are beginning to use a new breed of microscopes, one that is designed to work with ultraviolet (UV) light rather than visible light.** Although a special video camera is required to interpret the results, the resolution is at least twice as good as conventional microscopes. Since modern integrated circuit design requires ever-smaller semiconductors, optical inspection must struggle to keep up. UV microscopes require a special type of lens design and a brighter-than-average UV light source, since many materials under examination tend to absorb more UV light than visible light. But the results are well worth it; objects smaller than one-tenth of a micron can be examined, just in time for the latest advance in transistors.

■ **Just as "talkies" ended the careers of some silent-film stars, High-Definition Television (HDTV) is causing some TV news personalities to re-think their appearance on camera.** The resolution of the cameras and view-screens is so much greater than conventional video that many surface flaws in backgrounds, studio sets, and even people themselves are delivered just as they are seen in real life. Makeup now looks like makeup; instead of erasing blemishes, it calls attention to itself. In addition, as real-time high-resolution graphics engines increase in power and decrease in price, TV stations may decide to invest in "digital" news anchors who can change or improve their appearance at the touch of a button, never go on vacation, and never take a day off.

■ **Is the line really busy?** A few customers of some U.S. telephone companies

are questioning the use of a new kind of busy signal. Instead of the usual electronic beeping signal, you hear a recording that says the line is busy and that, for 50 cents, the phone company will keep dialing the number until it is answered. Some customers claim that said voice-prompting has occurred even when they know for a fact that the line is not busy, because redialing manually a few seconds later puts the call through as always. Are phone customers being gently chiseled? Besides, this new voice-prompt system disrupts the automatic redialing features built into computer modems and fax machines, making those features useless.

■ **The downlink signal from Direc-TV's geosynchronous satellite varies in intensity, depending on where you are in the U.S.** The system's designers examined geographic charts of average rainfall. Rain attenuates an RF signal in the gigahertz range, so more power is required to reliably deliver a signal through it. Since customers pay to receive such a signal, those who live in rainy areas don't have to worry much about losing a program due to inclement weather.

■ **Presently, there are over half a billion copper telephone lines in use around the world.** That's quite a feat of 20th-century engineering, until we remember that there are also a dozen times more people on the planet than phone lines.

■ **"Where did I put that thing?"** Cellular telephones continue to get smaller. The newest cellular phones from Japan are only as long as half the page length of one of these columns, only half as wide, and only as thick as a slice of bread.

## COMPUTER INFO

■ **Super-hacker Kevin Mitnick - ex-N6NHG - was released on Jan. 21 from Lompoc Federal Correctional Facility in California.** Now 36, the high school dropout spent the last five years behind bars for infiltrating and causing millions of dollars in damages to the computer networks of various technology companies including Motorola, Novell, Fujitsu, NEC, Nokia and Sun Microsystems.

Arrested in North Carolina in 1995, Mitnick pleaded guilty to five felony counts of computer and wire fraud and was sentenced to 46 months in jail. His

parole arrangement precludes him from using computers, modems, software, cell phones, the Internet ...or even portable phones for three years. The only communications device he is permitted is a land-line telephone.

Since computers are the only marketable skill Mitnick has, it is doubtful that he can find a job. Several computer security firms have offered him a position which he cannot accept.

A self-taught computer whiz, Mitnick wants to get a degree in Computer Science. His attorney will help try to persuade probation officials to allow enough access to computers to let him pursue studies on the college level.

Mitnick is a martyr among hackers because of his escapades and stiff sentences from authorities. His supporters say Mitnick never made money from his hacks and was just "having fun" ...and that the authorities tried to make an example of him. Others believe he got what he deserved.

On his release from prison, CBS "60 Minutes" aired a TV story about his exploits which it filmed while he was still in Lompoc prison. Mitnick plans to move in with his father, a general contractor in Los Angeles.

■ **Intel is releasing prototypes of and programming reference manuals for their new 64-bit microprocessor, due for commercial release later this year.** The new chip, called Itanium, used to be named Merced. It will run with a clock speed of at least 500 MHz, accesses up to 16 terabytes of memory, and can perform six billion instructions every second.

■ **Often times, the weakest link in a chain is the human being.** Psychologists who study human behavior report that, on the average, a data-entry worker makes at least one mistake for every 300 key-strokes. This is one reason why many warehouses use bar codes and automated retrieval systems.

## INTERNET NEWS

■ **There are presently over 800 million Internet Web pages,** with over a million more coming on line every day.

■ **The Internet is slowly being accepted as a place of genuine scholarship.** Like any library or newsstand, one must pick through the garbage to find the



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truly useful information. Pick up a new book on a historical topic and you're likely to find Web site addresses among the conventional sources in the bibliography.

## ■ Professional actors save time and money by receiving scripts through e-mail rather than the Postal Service.

Voice-over talents create Web pages that let potential clients point-and-click their way to listen to their skills, and a contact is only a mouse click away.

■ **The online travel business is heating up!** Microsoft's Expedia is pumping \$50 million into an ad campaign to promote the idea that it is a trusted travel counselor. They also dropped their registration and password requirement. Sabre-owned Travelocity has merged with Preview Travel. And a collection of 20 major airlines are starting their own travel site. Other big travel sites include Priceline.com, Liberty Travel and American Express Co.

■ **The "Fish Channel" has been available on cable TV systems for years**, offering viewers a look at tropical fish in someone else's tank. An update is now available on DVD. "Aquaria" is a video "eye candy" disc containing over 20 hours of video and sound. You can select between saltwater or freshwater tanks, the types of fish you want to see, what kind of soundtrack you want, and in what visual/audio format. The "Aquaria" DVD also includes detailed information on the various fish species, a computer screen saver, and links to tropical-fish Web sites.

• **High speed Internet access is growing sharply but judging by comments on the DSL newsgroups, Digital Subscriber Line is having serious growing pains.** There are complaints of long waits for the service, bad technical support, erratic connections and annoying, unpredictable "drop offs". DSL customers tend to be more technically advanced users and they want top service. Downloading data over a DSL connection can be up to 100 times faster than a dial-up modems. Cost is around \$40 per month.

DSL providers have been overwhelmed with requests for the fast service. The Yankee Research Group shows 300,000 residential DSL subscribers at the end of 1999 with a projected total of 900,000 subscribers by the end of 2000. The service was not even available in 1998.

The Yankee Group says that the total number of U.S. residential high-speed Internet access subscribers will grow to 3.3 million by the end of this year and 16.6

million by 2004, up from 1.4 million at the end of 1999.

At the end of 1999, nearly 80 percent of high-speed subscribers received service through cable modems. By the end of 2004, cable's market share will shrink to 42 percent as DSL services become more widely available.

The report said about 41 percent of all U.S. households will have access to cable modem service by the end of this year while DSL access will be more limited, with only 24 percent eligible for service by year's end. Currently, DSL is only available to consumers who live within a certain distance of central telephone facilities and have telephone equipment that meet certain requirements. [Reported by Reuters]

## WASHINGTON WHISPERS

■ **Can you guess who owns or operates the fastest computers in the world?** The Federal government owns supercomputers in energy- and nuclear-research labs across the country that operate at faster than one trillion floating-point operations per second.

■ **Untaxed products bought over the Internet is becoming a key presidential campaign issue.** John McCain signed a pledge not to tax Internet sales saying "...we should not harm this baby in the cradle." He challenged George W. Bush to take the same stand. Bush, who as the Governor of Texas, declined since state taxes would be adversely impacted if untaxed web sales mushroom. Bush said he favored continuing a moratorium on taxing e-commerce and advocated taking a harder look at web taxation issue three to five years from now.

The absence of state sales taxes on e-commerce is based on a Supreme Court decision requiring a business to have a physical presence in a state before it can be forced to collect sales taxes for that state.

A congressional panel is also considering the long-term future of Internet taxes, including whether to recommend a ban on all web sales taxes. Their final report is due to be presented to Congress on April 21<sup>st</sup>.

## AMATEUR RADIO

• **An early morning fire January**

## 23rd in a strip mall spread in the attic to several businesses including Ham Radio Outlet's Anaheim (California) store.

Store manager, Janet Margelli, KL7MF, reports that all inventory was lost except for a fiberglass tower-top Owl, which they now call "Smokey". Many hams turned out that morning to offer assistance, food, and moral support to all the HRO employees who arrived to see their building totally gutted. More than 80 firefighters fought the four alarm blaze for more than two hours before it was brought under control. The fire of suspicious origin started in a neighboring dental office and quickly spread to the rest of the mall. The store and its inventory was a total loss. No injuries were reported. Damage was estimated at \$1.5 million. The store is in the process of reopening in another undamaged store in the same shopping center. [Thanks: WB6NOA and ARRL.]

• **Air Force ICBM Rocket Carries Ham Satellites into Orbit** - After several postponements the maiden flight of a new U.S. Air Force booster known as Minotaur lifted off on January 26 from the new California Commercial Spaceport at Vandenberg Air Force Base in California.

Minotaur is a hybrid launch vehicle combining the first two stages of a decommissioned Minuteman II intercontinental ballistic missile (ICBM) with an Orbital Sciences Pegasus rocket. The primary mission of the launch was to determine if an ICBM can be used to launch satellites.

In addition to various Air Force and NASA experiments, several small student-built Amateur Radio satellites were on board including JAWSAT, OPAL, STEN-SAT and ASUSAT-1. JAWSAT - the Joint Air Force-Weber State University Satellite - is launch platform, that once in orbit can deploy independent satellites:

ASUSAT-1 - a microsatellite developed and built by the students at Arizona State University contains Amateur Radio packet hardware and a FM voice repeater.

OPAL, the Orbiting Picosat Automatic Launcher is a microsatellite developed and built by the students at Stanford University.

Following deployment, OPAL will in turn eject three small satellites, one of which will be STENSAT; a 12 cubic inch, 8.2 ounce ham radio satellite, which is intended for use by amateur radio operators worldwide. It will operate as a single channel, Mode-J, FM voice transponder ...much like AO-27. The VHF Uplink frequency is 145.840 MHz; UHF downlink 436.625 MHz.



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● **Clearwire Technologies, Inc., of Dallas, TX, a maker of Part 15 Spread Spectrum equipment** has filed a *Petition for Partial Reconsideration* in WT Docket 97-12 (the revision of amateur spread spectrum rules), seeking to have commercially manufactured amateur SS gear be, in effect, type accepted, and to require publishing on a web site of "information and algorithms necessary to decode the ID."

Part 15 devices are unlicensed equipment (such as microwave ovens) and have no spectrum rights as compared to a licensed service. The rules say Part 15 devices must accept harmful interference from licensed stations. This Petition has not been put on public notice yet, though it was filed on Oct. 25, 1999.

Clearwire is a high-speed, fixed wireless Internet access service that uses a point-to-multipoint local loop network instead of telephone wires and cable. The firm is using the ISM (industrial, medical and scientific) band located at 2400 to 2500 MHz (center frequency 2450 MHz) to build a high speed (up to 640 kilobits/second) wireless network to provide wireless Internet, data and telephone service to businesses. The privately -held firm was founded in 1998.

The Clearwire design uses direct sequence or frequency hopping spread spectrum to hop around interference and cover distances up to 25 miles from the base station. Apparently Clearwire wants to know what spreading formula amateur SS equipment will use so that they can avoid it.

● **AMAT's Phase 3D amateur satellite is in the process of being transported to Kourou in French Guyana and should be there by the time you read this.** It was shipped aboard a 767 Air France airliner on a flight from Atlanta via Paris. The container with the P3-D satellite weighs more than a ton. The second container with the SBS-adaptor and test equipment weighs approximately 2 tons. Both containers just barely find room in the cargo hold of the 767 wide-bodied aircraft.

The transport costs alone amount to about \$20,000. First the Orlando AMSAT team shipped the containers by truck to Atlanta. On the 17th of January the trip continued to Paris. From there it flies directly to Cayenne, the only airfield in French Guyana where it will be trucked to the launch facility; the European Space Agency's *Center Spatial Guyanese* in Kourou.

This is the only route that could be taken since there are no direct flights from the U.S. to Kourou. P3-D was be accompanied by Bob Davis, KF4KSS and Jay Ramdas, both from the integration team in Orlando and Peter Guelzow, DB2OS, P3-D operations manager, who joined them in Paris.

No official launch date has been announced yet, but chances for an early launch are pretty good after the last successful Ariane-5 launch. AMSAT P3-D becomes the

first secondary payload for an ARIANE 5 rocket launch.

According to DB2OS, the next launch of the ARIANE 505 is "fully booked" and takes place in March with two satellites; the "AsiaStar" and "Insat 3B" on board. "Arianespace is doing its best to accomodate us soon after AR505. Waiting is all what we can do now."

## **P3D Uplink Frequencies:**

	Digital	Analog
2m	145.800 - 145.840 MHz	145.840 - 145.990 MHz
70cm	435.300 - 435.550 MHz	435.550 - 435.800 MHz

## **P3D Downlink Frequencies:**

	Digital	Analog
2m	145.955 - 145.990 MHz	145.805 - 145.955 MHz
70cm	435.900 - 436.200 MHz	435.475 - 435.725 MHz

[Thanks: AMSAT]

## **HANDY INFORMATION IF YOU ARE A VE**

**How to check the FCC's Universal Licensing System to see if an Amateur Radio license has been granted:**

### **AMATEUR RADIO APPLICATION QUERY**

- 1.) Go to: <<http://www.fcc.gov/wtb/uls>> [Enter]
- 2.) Then click on the "Application Search" button.
- 3.) Select "General" Search type, Click on "Continue"
- 4.) Enter only the Applicant's name, last name first - followed by a comma, then first name or first initial.
- 5.) Click on "Search" at the bottom of the screen.
- 6.) This will bring you a screen that shows the status of the application, G for Grant, D for Dismiss, 2 for Still Pending.

**to obtain information on a licensed Amateur operator:**

### **AMATEUR RADIO LICENSE QUERY**

- 1.) Go to: <<http://www.fcc.gov/wtb/uls>> [Enter]
- 2.) Then click on "License Search" button.
- 3.) Select "General" Search type, Click on "Continue"
- 4.) Enter the applicant's name, last name first - followed by a comma, then first name or first initial [or you can enter the applicant's call sign or licensee ID.]
- 5.) Click on "Search" at the bottom of the screen.
- 6.) Click on call sign hyperlink.
- 7.) Under "License Options" select "Amateur Administration" to obtain license class.

● **The current five (Novice, Technician, General, Advanced and Extra Class) exam question pools are being folded into three.** The new (Element 2) Technician pool will primarily consist of questions from the current Element 2 (Novice) and Element 3A (Technician) pools. The new (Element 3) General pool will primarily come from the current Element 3B (General) pool. And the new Element 4 (Extra Class) pool will primarily consist of questions from the current Element 4A (Advanced) and 4B (Extra Class) pools. The plans are to have less than 400 questions each in the new Technician and General Class Pools and less than 650 in the Element 4 pool. All three question pools will be released to the public on February 1<sup>st</sup>. Check our website for more information.



### AMATEUR SERVICE RULES IN A NUTSHELL

Judging by the volume of inquiries we are getting, there still seems to be a lot of confusion surrounding the new Amateur Service restructuring...especially "exam credit." Here is a concise summary of the new rules.

- Effective April 15, 2000, applicants for Amateur Service licenses may only be examined for three levels of licenses. Technician, General and Extra Class.
- There will only be four license examinations administered in the Amateur Service on or after April 15, 2000. They are: Element 1 (5 words-per-minute Morse code), Element 2 (Technician theory), Element 3 (General Class theory) and Element 4 (Extra Class theory.) Element 2 and 3 have 35 questions each (26 correct passes) and Element 4 has 50 questions. pass rate is 37.
- The top examination telegraphy (Morse code) examination speed will be 5 wpm which is required for the General and Extra Class licenses. The format and character spacing of the 5 wpm is determined by the VE team. The answer format may be multiple choice, fill in the blank or one minute solid copy. As of April 15, 2000, waivers of the higher speed telegraphy examinations will no longer be needed.
- The Novice, Tech Plus and Advanced Class licenses will be continued in the FCC database, but no new Novice, Tech Plus or Advanced Class licenses will be issued after April 15 2000.
- Novice and Advanced Class licenses may be renewed and modified (that is, name, address and call sign may be changed). If these licensees do not upgrade, they will remain permanently in the FCC database as Novice and Advanced...and will retain their Novice and Advanced Class privileges.
- Tech Plus licensees will also remain in the database, but their licenses will be renewed as Technician with permanent credit for Element 1 (5 wpm.). New Technician Class amateurs - including those who pass 5 wpm after April 15, 2000 - will also receive a Technician Class license. Thus some Technicians in the FCC database will have 5 wpm credit and will be able to operate on the four HF Novice-Tech Plus segments at 80, 40 and 15 CW and 10 meter CW/SSB.
- Their authority to operate HF will be the *Certificate of Successful Completion of Examination* (CSCE) received from the VE team when they passed the 5 wpm code exam. Other Technicians will be "Codeless" Technicians and will not have HF privileges.
- The FCC is relying on the amateur community's long history of self-policing to insure that No Code Technicians do not operate on 10 meter sideband without passing 5 wpm. Where there is a question, the VE team or VEC will be able to confirm that a Technician has indeed passed 5 wpm from their records.
- A CSCE confers two types of authority - examination credit and operating authority. A CSCE issued when an applicant passes 5 wpm confers permanent operating authority on the Novice-Technician Class HF bands. (i.e. CW: 80m - 3.675-3.725 MHz, 40m - 7.10-7.15 MHz, 15m - 21.10-21.20 MHz and 10m - 28.10-28.50 MHz. SSB: 10m - 28.3-28.5 MHz.) A CSCE confers *examination credit* only for 365 days. Thus a Technician amateur who has previously passed 5 wpm more than one year prior to upgrading to the General Class must re-take the 5 wpm examination again.
- **Technician examination credit.** Technician Class amateurs examined prior to March 21, 1987 receive exam credit for new Elements 1, 2 and 3 and are eligible for upgrade to the General Class on or after April 15, 2000 without further examination. This is even true if their license has been expired more than two years and he/she is no longer shown in the FCC database. A license of an "Old Tech" may be dated up to 4 months after March 21, 1987 due to the lag between examination and licensing.
- Technicians examined prior to February 14, 1991 receive examination credit for Element 1 (5 wpm code) and Element 2 (new Technician.) This is even true if the applicant is no longer an amateur and his/her license has expired more than two years ago. (The Technician license may be dated up to March 12, 1991.)
- The FCC is holding the VECs responsible for determining and examining the evidence used to determine that a Technician qualifies for Element 1, 2 and 3 ("Old Tech") or Element 1 and 2 (Technician prior to No-Code license) examination credit. Most VECs will also accept a page from an old (pre-1987) Callbook in addition to a CSCE or an old license copy.
- Technicians examined after February 14, 1991 receive credit only for Element 2. Tech Plus (or Technicians with a 5 wpm code CSCE) receive exam credit for new Element 1 and 2.
- Examination credit for applicants of all other classes (i.e. Novice, General and Advanced) requires that the applicant hold an unexpired license (or being the two year grace period for renewal.) In other words, they must be continuously licensed. A Novice receives examination credit only for Element 1, a General and Advanced Class operators receive exam credit for Elements 1, 2 and 3
- Prior to April 15, 2000, existing amateurs may take the current written examinations needed for the General and Extra Class licenses. These examinees will not upgrade at that time, but may use their CSCE as credit toward the new General and Extra Class license.
- A Tech Plus operator taking the current (General written) Element 3B will qualify for the new General Class without further examination when they present their CSCE for Element 3B to a VE team at an exam session on or after April 15<sup>th</sup>.
- An Advanced Class operator taking the current (Extra Class written) Element 4B will qualify for the new Extra Class without further examination when they present their CSCE for Element 4B to a VE team at an exam session on or after April 15<sup>th</sup>.
- A General Class operator would have to pass both the current Element 4A (Advanced) and 4B (Extra) to qualify for the Extra Class on or after April 15<sup>th</sup>. Most General Class operators will probably elect to wait until April 15<sup>th</sup> to take the new Element 4 since only one 50 question examination will be required.
- A No Code Technician may take the current Element 3B (General written) examination without first taking the 5 wpm code exam. The CSCE for 3B may be used as Element 3 credit for one year during which time the applicant would have to pass Element 1 (5 wpm.)
- All amateur frequency band allocations for the various license classes remain the same. The FCC did not accept the ARRL's "refarming" of the Novice frequency band proposal which would have yielded additional frequencies.